

WE CLAIM:

1. A computer system for providing network training to students operating nodes linked to a data communications network, comprising:

a network training laboratory comprising computer networking devices communicatively linked to implement a functioning electronic communications network and operating in a first operation mode; and

a training host communicatively linked to the communications network and to the network training laboratory for providing a communication connection between the computer networking devices and the student nodes and for generating and transmitting to the student nodes a student user interface comprising graphical representations of the computer networking devices in the network training laboratory;

wherein the training host is further adapted to provide a particular communication connection to a particular one of the computer networking devices in response to a student node selecting the graphical representation corresponding to the particular computer networking device.

2. The computer system of claim 1, wherein the computer networking devices include native interfaces and the communication connection provided by the training host is adapted for providing the native interface of the particular networking device to the selecting student node and for transmitting instructions to change the particular computer networking device from the first operation mode to a second operation mode.

3. The computer system of claim 1, wherein the training host includes a Web server and the student user interface is a graphical user interface comprising a Web page.

4. The computer system of claim 1, wherein at least one of the student nodes is located at a location physically remote from the network training laboratory.

5. The computer system of claim 1, wherein the computer networking devices include a router, and wherein the training host includes a router control

server connected to the router and configured for providing the communication connection from the student nodes to the router.

6. The computer system of claim 5, wherein the router control server is configured as a terminal server with a terminal emulation program that enables the student nodes to remotely operate the router control server to provide the communication connection between the router and the student nodes.

7. The computer system of claim 1, wherein the computer networking devices include a server, and wherein the training host includes a server control server connected to the server in the network training laboratory and configured for providing the communication connection from the student nodes to the server.

8. The computer system of claim 7, wherein the server control server includes a remote access program that enables remote control of the server control server to achieve the communication connection between the server and the student nodes.

9. The computer system of claim 1, further including an instructor node communicatively linked to the communications network and adapted for transmitting a network state instruction set to the training host, wherein the training host is configured to respond to receipt of the instruction set by placing the computer networking devices in a second operation mode.

10. A method for providing network training to students at locations remote from a network training laboratory comprising computer networking devices for implementing a functioning electronic communications network, the method comprising:

positioning the network training laboratory at a laboratory site;
placing the computer networking devices in the network training laboratory into a first operating state;
establishing a communications link between the network training laboratory and a training host;

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10 with the training host, generating a transmittal form comprising
identifying information for each of computer networking devices in the network
training laboratory;

establishing a communications link over a communications network
between the training host and a remote node located at a site differing from the
15 laboratory site; and

operating the training host to transfer the transmittal form over the
communications network to the remote node.

11. The method of claim 10, further including operating the remote
node to view the transmittal form and to select one of the computer networking
devices and further including responding with the training host to the selection
by establishing a communication connection between the remote node and the
5 selected one of the computer networking devices.

12. The method of claim 11, wherein the transmittal form includes a
relational map of the computer networking devices with icons corresponding to
each of the computer networking devices.

13. The method of claim 11, further including receiving at the remote
node a native interface transmitted over the communications connection for the
selected one of the computer networking devices, operating the remote node to
enter a state change instruction through the native interface, and operating the
5 selected one of the computer networking devices in response to the state change
instruction to move to a second operating state.

14. The method of claim 13, further including saving information for
the first operating state and the second operating state and with the training
host, using the saved state information to place the computer networking devices
5 in the network training laboratory into the first operating state or the second
operating state.

15. The method of claim 13, further including establishing employment
criteria, wherein the first operating state is selected based on the employment
criteria, and further including providing a job applicant with access to the

remote node and comparing the second operating state to predefined acceptable
operating states selected based on the employment criteria.

16. A method of using a remote node to remotely operate a functioning electronic communications network having a plurality of computer networking devices including routers and servers, comprising:

providing a host computer system linked to a communications
network, the host computer system including a router controller and a server
controller;

communicatively linking the remote node to the communications
network;

establishing a communication link between the host computer
system and the electronic communications network, wherein the router
controller is linked to at least one of the routers and the server controller is
linked to at least one of the servers;

operating the remote node to select an operating state for the linked
routers, wherein the linked routers are configured to the selected operating state
based on communications from the remote node transmitted over the
communications network to the router controller; and

operating the remote node to select an operating state for the linked
servers, wherein the linked servers are configured to the selected operating state
based on communications from the remote node transmitted over the
communications network to the server controller.

17. The method of claim 16, wherein the router controller is a terminal server including a terminal emulation program and the server controller is a server including a remote access program.

18. The method of claim 16, wherein host computer system includes a server, and further including operating the server to create and transmit a user interface over the communications network to the remote node including graphical representations of the computer networking devices, and wherein the
operating steps of the remote node include selecting one of the graphical
representations and operating the host computer system to create a

communication connection between the remote node and a computer networking device corresponding to the selected graphical representation.

19. The method of claim 16, wherein the host computer system further includes a power controller linked to the computer networking devices and adapted for selectively providing power to each of the computer networking devices, and further including operating the power controller remotely from the remote node to control the selective provision of power.

20. A method of providing online training using a centralized, fully operational computer laboratory, comprising:

providing a network training laboratory comprising operating computer network devices linked and configured as a functioning network;

inserting a training host including an administrator mechanism between the network training laboratory and a data communications network, wherein the training host is communicatively linked to the data communications network and the network training laboratory to provide a direct communications path to the network devices of the laboratory;

connecting an instructor node to the data communications network; connecting a student node to the data communications network;

first operating the administrator mechanism to deliver an instructor interface to the instructor node, wherein the instructor interface is configured to provide access over the direct communications path to each of the network devices of the laboratory; and

second operating the administrator mechanism to deliver a student interface to the student node, wherein the student node is configured to provide access over the direct communications path to a course subset of the network devices of the laboratory.

21. The method of claim 20, further including connecting an administrative node to the data communications network and third operating the administrator mechanism to deliver an administrative interface to the



5 administrative node that is configured to provide access over the direct communications path to each of the network devices of the laboratory.

22. The method of claim 21, wherein the administrative interface is further configured to enable a user of the administrative node to monitor and control the first and second operating of the administrator mechanism to selectively provide the student and instructor interfaces.

23. The method of claim 21, further including connecting a training partner node to the data communications network and fourth operating the administrator mechanism to deliver a training partner interface to the training partner node, wherein the training partner interface is configured to provide access to a resource scheduling application of the training host that is adapted for monitoring availability of the laboratory and for controlling access to the laboratory to reserved times.

24. The method of claim 23, wherein the resource scheduling application operates to display the availability of the laboratory through the training partner interface, to receive reservation requests from the instructor node, and to update the reserved times based on the received reservation requests.

25. The method of claim 24, wherein resource scheduling application is further adapted for display profile information pertaining to the training partner including previous payment information and to request and receive through the training partner interface input payment information, and further, wherein the resource scheduling application verifies the input payment information prior to updating the reserved times.

26. A method of administering configuration of and access to a network training laboratory including operable network devices linked and configured as a functioning computer network, the method comprising:



5 communicatively linking a training host to the network training
laboratory and to a communications network, wherein the training host includes
an administrator mechanism adapted for generating a plurality of user
interfaces providing a plurality of differing levels of administrative and
communication access to the training host and to the network devices of the
10 laboratory;

 first providing with the administrator mechanism an
administrative one of the user interfaces to an administrative node in
communication with the communications network, the administrative user
interface being configured to grant a user of the administrative node full access
15 to the training host and each of the network devices;

 second providing with the administrator mechanism an instructor
one of the user interfaces to an instructor node in communication with the
communications network, the instructor user interface being configured to grant
a user of the instructor node access to each of the network devices; and

 third providing with the administrator mechanism a student one of
the user interfaces to a student node in communication with the communications
network, the student user interface being configured to grant a user of the
student node access to a course subset of the network devices.

27. The method of claim 26, further including fourth providing
with the administrator mechanism a training partner one of the user interfaces
to a training partner node in communication with the communications network,
the training partner interface being configured to grant a user of the training
5 partner node communication access to a resource reservation application of the
training host.

28. The method of claim 27, wherein the resource reservation
application operates to display available time periods for the laboratory via the
training partner interface at the training partner node, to receive selection input
5 requesting one of the time periods from the training partner node via the
training partner interface, and to remove the requested time period from the
available time periods.

29. The method of claim 26, wherein prior to the first, second, and third providing, the administrator mechanism requests, receives, and verifies login information from the users of the administrator node, the instructor node, and the student node.

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